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AUTHOR Morrison, Beverly
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ABSTRACT

A questionnaire was designed to give content area teachers an opportunity to review 35 reading/learning skills that are necessary for vocabulary development, the comprehension of written materials, and the efficient use of study time. Over 400 secondary school teachers in seven content areas (English/language arts, social studies, science, mathematics, home economics, business education, and industrial arts) were asked to indicate the relevancy of each skill for learning their subject matter and their expectations of a student's ability with that skill. The data, analyzed across and within content areas, indicate widespread recognition of the relevancy of the reading/learning skills as well as the expectation that students will need help in applying these skills to learn content. (A copy of the questionnaire is included.) (Author/MKM)

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Technical Report No. 528

THE IDENTIFICATION OF READING SKILLS ESSENTIAL FOR LEARNING IN SEVEN CONTENT AREAS AT POSTELEMENTARY LEVELS

by

Beverly Morrison

Report from the Project on
Studies in Language: Reading and Communication

Wayne Otto
Faculty Associate

Wisconsin Research and Development Center
for Individualized Schooling
The University of Wisconsin
Madison, Wisconsin

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THE IDENTIFICATION OF READING SKILLS ESSENTIAL FOR LEARNING IN SEVEN CONTENT AREAS AT POSTELEMENTARY LEVELS

Public concern has been expressed recently about students at post-elementary levels who cannot read, but for teachers at these levels, the fact that students are unable to read their assigned materials effectively has been obvious for some time. One reason for this inability could be that students who learned reading skills at the elementary level with narrative materials do not understand how to apply those skills to expository materials encountered at later grade levels. The purpose of this study was to determine which skills usually taught with narrative materials at the elementary level must be applied to expository materials at postelementary levels to ensure effective learning in specific content areas.

Rationale

In the curriculum at the elementary level, reading is considered an extremely important subject. A considerable amount of time is spent teaching students how to read during the "reading period," and many types of materials can be used, almost all of them narrative in nature. In some of these materials skills are the focus of the instruction, but in others skills are taught only incidentally. For this reason we can be reasonably sure that all students at the elementary level are exposed in some manner to reading skills during the reading period, but we cannot

be sure of the depth or breadth of this exposure. In addition, evidence shows that although teachers at the elementary level understand the importance of applying essential reading skills to expository materials in various content areas, the constant pressure of time often prevents them from carrying out many application activities (Kamm, White, & Morrison, 1978). One possible conclusion is that while students spend a great deal of time learning to read at the elementary level, the instruction they receive is based primarily on narrative material.

The role of reading in the curriculum changes during the post-elementary years. Reading is no longer a separate subject, but instead is an important process the student should have well in hand. The materials the student is required to read during most of the school day are mainly expository. Because of the different emphasis on reading, most formal reading instruction is remedial rather than developmental at the postelementary level (Freed, 1972). The average student at the post-elementary level, then, is suddenly faced with the task of reading increasing quantities of expository materials without additional reading instruction. These assigned readings, having both greater syntactic complexity and a heavier concept load, are much more difficult to understand. To complicate the situation even further, students are required to assimilate a large number of lengthy assignments relatively quickly.

Obviously the student at the postelementary level needs to be able to apply the reading skills learned during the elementary years quickly and efficiently. But, if average students are not independently transferring the reading skills they learned with narrative materials to more advanced expository materials, how can they develop this ability?

Two remedies seem reasonable: 1) teacher assistance at the elementary level, and 2) teacher assistance at the postelementary level. Responsibility for such instruction should not be confined to only one level, due to the increasing difficulty of materials assigned, the still developing abilities of the student, and variations in teacher expertise. Clearly reading skill application activities must be part of the instruction at both learning levels. If such application activities are to become a reality, however, clear-cut agreement must be reached concerning which reading skills are essential for learning specific content area information at both elementary and postelementary levels.

The purpose of this study was to investigate which of the reading skills taught with narrative materials at the elementary level are relevant to, and thus need to be applied to, expository materials in specific content areas at postelementary levels. Presented first will be a discussion of how the skills under consideration were selected. This will be followed by a description of the questionnaire devised to investigate the skills and a description of how participating teachers were contacted. The results of the questionnaire will be presented for the total population and then for each of seven content areas: English/language arts, social studies, science, mathematics, home economics, business education, and industrial arts. Concluding remarks will address the implications of the findings for inservice and preservice teacher education.

Skills Identified for Review

Identifying the skills to be considered in this study was a two phase process. First of all, skills lists from various sources were brought together to create a massive bank of skills described at varying levels of specificity. Second, the skills were examined, duplicates were eliminated, and the remaining list was pared down to produce a comprehensive inventory of thirty-five skills.

Sources Consulted

Over the years a number of lists of reading skills have been devised. Each originated from a different source and each has a different purpose. The intention here was not to create still another list, but instead to prepare an inventory of reading skills that would incorporate the best features of other lists, be of manageable length, and be appropriate for use in postelementary content area classes. Three types of sources were examined to determine the skills that should be included in such a comprehensive list: a) skills lists designed for use at the elementary level, b) skills lists compiled for use at postelementary levels, and c) skills recommended by experts in reading and in specific content areas. A complete list of all the sources consulted is in Appendix A.

Skills Lists for Elementary Levels. One current estimate is that approximately 95% of the students in elementary schools in the United States learn to read through instruction from a basal reader (Smith, Otto, & Hansen, 1978). Each basal reader series is designed around a scope and sequence of reading skills. In addition, many school systems

have devised their own scope and sequence of reading skills. The reading skills from both these sources are the basis for the Wisconsin Design for Reading Skill Development (Otto & Askov, 1974). Having been implemented in schools for the last five to seven years, the skills included in the Wisconsin Design, have proved acceptable and appropriate to the reading development of students at the elementary levels (Kamm, 1978). Because of the proven workability and broad base of the Wisconsin Design, the skills of its six elements (word attack, study skills, comprehension, self-directed reading, interpretive reading, and creative reading) were chosen to represent the skills emphasized at the elementary levels.

Skills Lists for Postelementary Levels. During the last several years various lists of reading skills appropriate for students at postelementary levels have been compiled. Three of these lists, originating in diverse parts of the United States, were studied as representative for this level. The oldest of the three lists, produced by the Kansas Studies in Education (Kansas Studies, 1961), was first published in 1960 and offered separate lists of skills for five subject areas: language arts, social studies, science, mathematics, and industrial arts. These lists were accompanied by "illustrative methods and devices" the teacher could use to improve reading in that subject area.

The other two lists reviewed were both produced in the mid-1970s. One resulted from the efforts of individuals in the Indiana Department of Public Instruction (Reading Effectiveness, 1975), and the other was produced by representatives of the University of Florida and the Florida Department of Education (Powell, et al., 1976). The Florida list, aimed at identifying the basic skills of reading, categorized skills at three

levels: Pre-Literacy Level, Basic Literacy Level and Career Literacy Level. The Indiana compilation offered background information and suggestions for teaching developmental skills of vocabulary, comprehension, and study skills in five areas: English, social studies, science, mathematics, and home economics.

Skills Recommended by Experts. The writings of two types of experts were considered: a) reading experts who have considered the reading skills necessary for learning information in specific content areas, and b) experts in various content areas who have written textbooks for teachers of postelementary level subjects.

Renewed interest in postelementary reading instruction has brought about an increase in the number of texts covering the teaching of reading, but not all of these specify reading skills for particular content areas. Six authors who clearly addressed specific reading skills were chosen for study here: Aukerman (1972), Hafner (1977), Harker (1977), Herber (1970), Karlin (1977), and Shepherd (1973). Others could have been included, but these six were chosen as representative.

Teaching methods textbooks were reviewed for six content areas: English/language arts, social studies, science, mathematics, home economics, and industrial arts. Each textbook was chosen either because it was required reading in the methods course on the UW-Madison campus or because it was recommended by a teacher of methods courses on another campus. Each book was reviewed with two purposes in mind: a) to determine how much emphasis is given to students' reading processes in the training of preservice teachers in the six content areas, and b) to determine what reading strategies content area experts consider necessary

for learning.

Review Procedures

As the skills were compiled they were assigned to one of three categories: Word Attack/Vocabulary, Comprehension, and Study. When the skills from all of the sources had been categorized, the first thing that became apparent was that the same skills were listed by two or more sources and there was considerable overlap. This very obvious duplication of skills allowed the first round of eliminations to be made by one person. The second cut in the preparation of the final skills list was conducted by a panel of three people in the field of reading including one professor, one lecturer, and one research specialist. This panel reviewed each of the skills to determine the author's intended meaning and then eliminated those that were redundant. The resulting list of thirty-five skills (Appendix B) was then submitted to two additional people in reading who had extensive experience in working with public school teachers. Their suggestions, dealing primarily with terminology, were incorporated. The final thirty-five skills by category included: Word Attack and Vocabulary, 6 skills; Comprehension, 14 skills; Study, 15 skills.

Questionnaire

A six page questionnaire based on the comprehensive list of reading skills was constructed (Appendix C). Respondents were asked to indicate their content area specialization and the names of the classes they were currently teaching. Five additional facts were requested:

total years of teaching experience, number of years of teaching in that content area, total number of graduate credits completed in education, number of graduate credits completed in the teaching of reading, and the approximate number of students attending the school in which they were currently teaching.

The thirty-five skills were listed in their three designated categories, and the teachers were asked to indicate: a) the relevance of each skill to their subject area, and b) their expectations of their students' abilities to use that skill. As a basis for their responses, the teachers were asked to select one class they were currently teaching. To specify the relevance of each skill for that class the teachers were asked to choose 1 of 3 statements:

- All students must have and be able to apply this skill to deal with the subject matter in this class.
- This skill is not essential for dealing with the subject matter in this class.
- Depends - (please explain).

To communicate expectations of their students' abilities to use each skill the teachers were asked to choose 1 of 2 statements:

- I expect that students will need my help in using this skill in my class.
- I expect students to have this skill well developed and functioning before arriving in my class so I do not pay any attenton to it.

Following the list of skills in each category, space was provided for the respondents to list any skills they thought were missing and to offer additional comments.

Subjects

An attempt was made to select a representative cross-section of postelementary teachers to review the comprehensive skills list. First, school administrators were contacted to request the names of individuals on their staffs who would be willing to review skills in each of seven content areas: English/language arts, social studies, science, mathematics, business education, industrial arts, and home economics. Two hundred administrators were contacted, using a mailing list compiled from a) individuals active in developing a national league of innovative postelementary schools, and b) all postelementary schools in the greater metropolitan area of two midwestern cities. Ninety-seven administrators responded to the request and each identified from 1 to 25 teachers who might review the reading/learning skills list. In this way a list of 770 teachers was gathered. Each teacher was then contacted individually by letter and asked to participate. The questionnaire, which could be completed anonymously, was to be returned in a post paid envelope. The teachers were asked, therefore, to contribute only the time necessary to answer the questions. The questionnaire was returned by 435 teachers (56.49%).

Results

The results of the questionnaire are presented first for the total number of respondents and then for each of seven content areas. For each content area the characteristics of the responding population are

described first, followed by the reaction of the respondents to the skills presented in the three categories of Word Attack and Vocabulary Skills, Comprehension Skills, and Study Skills. Additionally, the results are reported by content area with a focus on the grade level taught by the respondents.

Interpreting the data to compile a validated list of reading skills, I first calculated the percentages of teachers who reported each skill was relevant to learning subject matter in their study area. Then the percentages who believed they would need to offer help with each skill were calculated. I decided that a skill must be held relevant by at least 50% of our respondents to be included in our final list. In other words, the responses were dichotomized; scores above 50% meant a skill was accepted on the list, and less than 50% meant rejection. In the following explanation of the findings, I discuss skills accepted by 50% or 75% of teachers; these levels were used as essentially arbitrary indications of moderate or strong relevance. The percentages of teachers who believed they would need to offer help with a skill were used to indicate the teachers' awareness of the importance of reading skills to their students' learning.

Total Population: Characteristics of the Respondents

Of the teachers contacted, 56.49%, or 435, returned a completed questionnaire. Responses were received from teachers representing the seven specified content areas, plus these additional areas: special education, fine arts, foreign language, and reading. Six blank questionnaires were returned by individuals who indicated they could

not offer any input. The number of respondents in each content area is presented in Table 1. Because the purpose of this questionnaire was to sample opinions about reading held by teachers in various content areas, the responses from individuals who taught only in reading classes were coded separately.

The content area teachers who responded represented schools of all sizes, from those with fewer than 500 students to those with more than 4,000 students (Table 2). All postelementary grade levels were represented as well, as can be seen in Table 3. Because the organizational structure of schools differs and grade 9 sometimes is linked with grades 7 and 8 and at other times is joined with grades 10-12, the respondents have been clustered in the following grade level units: 6, 7-8, 9, 10-12.

The years of teaching experience reported by the participating teachers is presented in Table 4. Some respondents were in their first year of teaching while others had spent more than 35 years in the classroom; only 7.98% of the respondents reported less than 5 years of teaching experience.

Part of the educational experience obtained by respondents since they completed their undergraduate degrees is reported in Table 5. The number of graduate credits completed in education ranged from 0 credits to more than 36. The figures in this table, however, do not represent the total educational experiences of the teachers. A number of teachers offered the information that they had completed very few credits in education but had completed a master's degree or more in a specific subject area, such as history or English literature. This

Table 1

Total Population: Content Areas Taught by Respondents

Content area	Number of respondents	Percent of respondents
English	88	20
Social studies	59	14
Science	71	16
Mathematics	65	15
Home economics	37	9
Business education	37	9
Industrial arts	27	6
Fine arts	8	2
Foreign language	2	less than 1
Special education	7	2
Reading	28	6
Declining to participate	6	1
TOTAL	435	

Table 2

Total Population: Size of

School Represented by Respondents

Number of students	Number of respondents	Percent of respondents
Fewer than 500	1	less than 1
500 - 999	60	15
1000 - 1499	121	30
1500 - 1999	71	18
2000 - 2499	48	12
2500 - 2999	46	11
3000 - 3499	24	6
3500 - 3999	17	4
More than 4000	13	3
TOTAL	401	

Table 3

Total Population: Grade Levels

Taught by Respondents

Grade	Number of respondents	Percent of respondents
6	3	less than 1
7-8	156	39
9	57	14
10-12	185	46
TOTAL	401	

Table 4

Total Population: Years of

Teaching Experience of Respondents

Number of Years	Number of respondents	Percent of respondents
Fewer than 5	32	8
5 - 9	104	26
10 - 14	108	27
15 - 19	67	17
20 - 24	41	10
25 - 29	31	8
30 - 34	15	4
35 or more	3	less than 1
TOTAL	401	

Table 5

Total Population: Graduate Work

Completed by Respondents

Number of credits	Credits in general education: number (percent) of respondents	Credits in teaching of reading: number (percent) of respondents
0	45 (11)	296 (74)
1 - 3	9 (2)	44 (11)
4 - 6	20 (5)	27 (7)
7 - 12	31 (8)	17 (4)
13 - 18	43 (11)	5 (1)
19 - 24	36 (9)	6 (2)
25 - 36	96 (24)	5 (1)
More than 36	121 (30)	1 (less than 1)
TOTAL	401	401

information, because it was not systematically obtained, is not reported here. About three quarters of the respondents (73.81%) reported they had obtained no graduate credits in the teaching of reading.

Total Population: Reactions of Respondents to Word Attack and Vocabulary Skills (Table 6)

For the total population, five of the six skills in the Word Attack/Vocabulary category were reported by at least 75% of the respondents to be relevant for learning their subject matter. In addition, at least 50% of the respondents who thought the skills were relevant expected they would need to offer help when students were required to use the skills in class. The only skill not considered relevant by at least 75% of the respondents was using clues from the sentence to determine the correct pronunciation of a word. This skill, however, was still considered relevant for learning by at least 50% of the respondents.

Total Population: Reactions of Respondents to Comprehension Skills (Table 7)

Nine of the fourteen skills in the Comprehension category were considered by at least 75% of the total number of respondents to be relevant for learning their subject matter. In addition, at least 50% of the respondents who thought the skills were relevant expected they would need to offer help when students were required to use the skills in class. The five skills not included at the 75% relevancy level were: a) interpreting specialized notations, b) considering author's purpose, c) distinguishing fact from opinion, d) recognizing per-

Table 6

Word Attack/Vocabulary Skills: By Content Area, Reaction of Respondents to Individual Skills

	English		Social studies		Science		Mathematics		Home economics		Business education		Industrial arts		All respondents	
Skill	R[a]	E[b]	R	E	R	E	R	E	R	E	R	E	R	E	R	E
1[c]	94	45	81	49	86	57	55	60	72	44	81	45	76	37	79	50
2	98	75	95	82	81	72	77	72	95	67	89	73	77	65	88	74
3	81	67	55	59	49	83	38	64	57	62	68	59	60	67	59	66
4	97	27	89	31	93	44	91	31	95	32	95	34	92	36	93	34
5	95	83	91	78	94	82	81	77	80	59	84	61	52	75	86	77
6	84	91	93	89	97	96	91	93	97	97	92	91	96	92	91	92
Range of relevancy levels	81 - 98		55 - 95		49 - 97		38 - 91		57 - 97		68 - 95		52 - 96		59 - 91	
Median of relevancy levels	94.5		90		89.5		79		87.5		86.5		76.5		87	
Range of expectation levels	27 - 91		31 - 89		57 - 96		31 - 93		32 - 97		34 - 91		36 - 92		34 - 92	
Median of expectation levels	71		68.5		77		68		60.5		60		66		70	

[a] R = Percent reporting skill relevant to subject matter.

[b] E = Of those reporting skill relevant, percent expecting to need to offer help.

[c] Reading/learning skills for postelementary levels are listed in Appendix B.

Table 7

Comprehension Skills: By Content Area, Reaction of Respondents to Individual Skills

	English		Social studies		Science		Mathematics		Home economics		Business education		Industrial arts		All respondents	
Skill	R[a]	E[b]	R	E	R	E	R	E	R	E	R	E	R	E	R	E
1[c]	99	77	95	66	92	58	64	67	89	52	84	52	85	62	87	64
2	99	79	98	74	87	60	54	64	86	52	84	60	77	55	85	68
3	95	77	90	69	79	71	85	71	84	55	65	58	69	68	83	70
4	98	93	98	95	97	93	88	95	81	84	70	85	73	77	89	91
5	27	90	46	97	91	97	95	94	60	87	68	92	82	82	63	93
6	46	81	97	88	99	90	94	85	89	90	60	83	96	77	79	86
7	92	92	73	89	30	74	24	77	37	70	54	86	36	38	54	84
8	96	89	98	93	76	84	22	69	60	91	49	72	31	57	68	86
9	89	95	86	94	33	81	19	69	56	90	41	87	12	100	53	90
10	89	91	90	91	73	82	65	78	76	82	68	62	58	80	76	83
11	94	84	97	81	87	82	57	83	67	74	73	82	48	73	79	82
12	95	91	97	86	93	72	78	84	86	56	70	62	63	69	86	79
13	95	90	100	86	97	74	92	93	97	84	87	84	100	73	95	85
14	94	93	84	72	67	49	65	81	50	82	73	70	52	64	74	76
Range of relevancy levels	27 - 99		46-100		30 - 97		19 - 95		37 - 97		41 - 87		12-100		53 - 95	
Median of relevancy levels	95		97		89		65		78		68		65		79	
Range of expectation levels	77 - 95		66 - 97		49 - 97		64 - 95		52 - 91		52 - 92		36-100		64 - 93	
Median of expectation levels	90		87		77.5		79.5		82		77		71		83.5	

[a] R = Percent reporting skill relevant to subject matter.

[b] E = Of those reporting skill relevant, percent expecting to need to offer help.

[c] Reading/learning skills for postelementary levels are listed in Appendix B.

suasive techniques, and e) making use of transitional words, phrases and clauses as bridges to join ideas. All five skills, however, were considered relevant for learning by at least 50% of the respondents.

Total Population: Reactions of Respondents to Study Skills (Table 8)

Ten of the fifteen skills in the Study skills category were considered by at least 75% of the total number of respondents to be relevant for learning their subject matter. In addition, at least 50% of the respondents who thought the skills were relevant expected they would need to offer help when students were required to use the skills in class. Of the five remaining skills, three were reported by at least 50% of respondents as relevant for learning, but at this level two skills were still excluded from the list of relevant skills. The three marginal skills are: a) skimming material for overview, b) taking notes in informal/formal outlines, and c) utilizing sources to locate materials. The two skills excluded are: a) taking notes as cognitive maps, and b) taking notes by marking directly on text.

English/Language Arts: Characteristics of the Respondents (Table 9)

Of the teachers responding to the questionnaire, 88 reported they were English/language arts teachers. The mean number of years of teaching experience for these respondents was 13.114 and the mean number of graduate credits completed in education was 27.784. Of the 88 respondents in this area, 41 (46.59%) indicated they had completed no graduate credits in the teaching of reading. An affiliation with grades 7 and 8 was reported by 43 respondents, while 45 indicated they taught grades 9 through 12. Over 58% of the respondents indi-

Table 8

Study Skills: By Content Area, Reaction of Respondents to Individual Skills

Skill	English		Social studies		Science		Mathematics		Home economics		Business education		Industrial arts		All respondents	
	R[a]	E[b]	R	E	R	E	R	E	R	E	R	E	R	E	R	E
1[c]	97	88	91	77	78	59	66	63	86	63	92	56	81	62	84	71
2	81	90	84	88	73	79	69	72	58	77	61	57	88	60	73	79
3	88	68	88	73	85	52	75	55	75	52	89	49	70	37	83	60
4	87	66	91	62	77	38	67	48	64	48	87	53	67	25	79	54
5	96	91	91	82	77	77	79	84	81	90	84	65	74	65	84	82
6	72	71	86	76	74	52	62	58	90	50	76	69	69	47	74	63
7	81	75	88	69	82	51	71	72	90	59	84	72	89	57	85	66
8a	90	82	93	82	82	73	55	64	86	70	67	71	60	57	78	75
8b	84	93	83	89	80	79	40	82	67	91	56	67	57	69	69	85
8c	33	92	76	89	49	83	33	84	16	100	23	71	32	43	40	84
8d	39	92	27	69	20	50	36	63	23	86	31	42	23	50	30	70
9	94	65	93	73	94	65	86	73	89	56	86	77	81	73	90	69
10	100	62	98	57	81	40	48	63	92	50	87	66	85	27	85	55
11	95	76	97	79	70	58	29	61	65	63	58	77	52	64	70	71
12	94	87	100	86	90	77	95	82	100	70	87	87	77	48	93	81
Range of relevancy levels	33-100		27-100		20 - 94		29 - 95		16-100		23 - 92		23 - 89		30 - 93	
Median of relevancy levels	88		90		78		66		81		84		70		79	
Range of expectation levels	62 - 93		57 - 89		38 - 83		48 - 84		48-100		42 - 87		25 - 73		54 - 85	
Median of expectation levels	82		77		59		64		63		67		57		71	

[a] R = Percent reporting skill relevant to subject matter.

[b] E = Of those reporting skill relevant, percent expecting to need to offer help.

[c] Reading/learning skills for postelementary levels are listed in Appendix B.

Table 9

Characteristics of Population by Content Area

	English/ Language arts	Social studies	Science	Mathematics	Home economics	Business education	Industrial arts
Number of teachers responding	88	59	71	65	37	37	27
Number of years of teaching experience							
Range	1-35	1-39	1-35	4-29	3-32	2-33	1-32
Mean	13.114	14.237	15.141	13.092	12.216	15.432	14.148
Number of graduate credits in education							
Range	0-90	0-99	0-99	0-99	0-99	0-97	0-99
Mean	27.784	31.559	28.113	30.431	28.946	32.216	41.07
Number of graduate credits in the teaching of reading							
Range	0-45	0-30	0-8	0-10	0-3	0-6	0-6
% completing 0 credits	46.59	71.18	88.88	86.15	81.08	78.43	92.59
Grade levels represented							
6	0	0	0	2	1	0	0
7 and 8	43	22	33	27	14	1	11
9	15	7	10	15	2	0	5
10-12	30	30	28	21	20	36	11
School size							
Fewer than 500	0	0	0	0	0	0	1
500 - 999	19	10	12	8	7	0	7
1000 - 1499	25	15	25	27	11	3	7
1500 - 1999	16	12	12	9	4	8	6
2000 - 2499	5	7	6	9	5	7	2
2500 - 2999	9	8	9	8	2	7	1
3000 - 3499	7	2	2	1	3	7	2
3500 - 3999	5	4	1	1	3	3	1
Over 4000	1	1	4	2	2	2	0

cated they taught in schools with fewer than 2,000 students.

English/Language Arts: Reactions of Respondents to Word Attack and Vocabulary Skills (Table 6)

All six skills in this category were identified by at least 75% of the respondents in English/language arts as relevant for learning their subject matter. At least 50% of the respondents who believed four of these skills were relevant also expected to need to offer help when students were required to use the skills in class. These four skills were: a) using clues from the sentence to determine the meaning of an unfamiliar word, b) using clues from the sentence to determine the correct pronunciation of a word, c) using roots, prefixes, suffixes to determine the meaning of a word, and d) seeking appropriate meaning for technical words and phrases. The remaining two skills--sounding out words and identifying at sight frequently used words--were also identified by at least 75% of the respondents as relevant for learning their subject matter, but less than 50% of these respondents expected to need to offer help with them.

English/Language Arts: Reactions of Respondents to Comprehension Skills (Table 7)

Twelve of the fourteen skills in this category were identified by at least 75% of the respondents in English/language arts as relevant for learning their subject matter. At least 50% of the respondents who indicated these skills were relevant also expected they would need to offer help when students were required to use the skills in class.

The remaining two skills in this category, (interpreting special-

ized notations and interpreting graphic displays) were identified as relevant by less than 50% of our respondents and thus cannot be included in the list of relevant Comprehension skills for English/language arts.

English/Language Arts: Reactions of Respondents to Study Skills

(Table 8)

Twelve of the fifteen skills in this category were identified by at least 75% of the respondents in English/language arts as relevant for learning their subject matter. At least 50% of the respondents who indicated these skills were relevant also expected they would need to offer help when students were required to use the skills in class.

One of the remaining three skills in this category (skimming material for an overview) can be included in the list of relevant study skills for English/language arts because it was believed relevant by at least 50% but less than 75% of respondents. On the basis of the 50% minimum criteria, however, the remaining two skills cannot be included on the list. These two skills are: a) taking notes as cognitive maps, and b) taking notes by marking directly on the text.

English/Language Arts: Additional Skills Suggested by Respondents

The following skills were offered by respondents in English/language arts as additions to the skills list on the questionnaire: mechanics of punctuation and capitalization, spelling, use of word parts to determine the meaning of compound words, meaning of pronoun referents, synonyms, antonyms, distinction between connotation and denotation, identification of writing styles (i.e., fiction, nonfiction, biography, autobiography), understanding literal vs. figuative language,

skills in critical thinking (e.g., making judgements based on evidence or on personal experience), classification skills, synoptic abilities (i.e., abilities to recognize and evaluate positions taken by several authors, regardless of genre, on one issue and to relate these results to the reader's own positions), following written directions, listening skills, and use of mnemonic devices.

Social Studies: Characteristics of the Respondents (Table 9)

Fifty-nine respondents reported they were social studies teachers. The mean number of years of teaching experience for these respondents was 14.237 and the mean number of graduate credits completed in education was 31.559. Of the 59 respondents in this area, 42 (71.18%) indicated they had completed no graduate credits in the teaching of reading. Affiliation with grades 9 through 12 was reported by 37 respondents, while 22 indicated they taught grades 7 and 8. Of the social studies teachers, 63% indicated they taught in a school with fewer than 2,000 students.

Social Studies: Reactions of Respondents to Word Attack and Vocabulary Skills (Table 6)

Over 75% of the respondents in social studies identified three of the six skills in this category as relevant for learning their subject matter. At least 50% of the respondents who indicated these skills were relevant also expected they would need to offer help when students were required to use the skills in class. These three skills were: a) using clues from the sentence to determine the meaning of an unfamiliar word, b) using roots, prefixes and suffixes to determine

the meaning of a word, and c) seeking appropriate meaning for technical words and phrases.

Two skills--sounding out words and identifying at sight frequently used words--were also identified by at least 75% of the respondents as relevant for learning their subject matter, but less than 50% of the respondents who believed these skills were relevant expected they would need to offer students help with them.

The remaining skill in this category (using clues from the sentence to determine the correct pronunciation of a word) was believed relevant by just over 50% of the respondents, and so can also be included in the list of relevant Word Attack/Vocabulary skills for social studies.

Social Studies: Reactions of Respondents to Comprehension Skills (Table 7)

Twelve of the fourteen skills in this category were identified by at least 75% of the respondents in social studies as relevant for learning their subject matter. At least 50% of the respondents who indicated these skills were relevant also expected they would need to offer help when students were required to use the skills in class.

One of the remaining two skills in this category can also be included in the list of relevant comprehension skills for social studies because the percentage of respondents who believed that skill relevant exceeded 50%, but one skill did not meet this level of recognition. The skill that can be included is considering author's purpose. The skill that cannot be included is interpreting specialized notations.

Social Studies: Reactions of Respondents to Study Skills (Table 8)

Fourteen of the fifteen skills in this category were identified by at least 75% of the respondents in social studies as relevant for learning their subject matter. At least 50% of the respondents who indicated these skills were relevant also expected they would need to offer help when students were required to use the skills in class.

The remaining skill in this category (taking notes by marking directly on the text) was not believed relevant by even 50% of our respondents, and so cannot be included in the list of relevant study skills for social studies.

Social Studies: Additional Skills Suggested by Respondents

The following skills were offered by respondents in Social Studies as additions to the skills listed on the questionnaire: punctuation skills, structural writing skills (e.g., paragraphs, topic sentence), recognition of expert sources, recognition of proper documentation.

Science: Characteristics of the Respondents (Table 9)

Seventy-one respondents reported they were science teachers. The mean number of years of teaching experience for these respondents was 15.141 and the mean number of graduate credits completed in education was 28.113. Of the 71 respondents in the Science area, 63 (88.88%) indicated they had completed no graduate credits in the teaching of reading. Affiliation with grades 7 and 8 was reported by 33 respondents, while 38 indicated they taught grades 9 through 12. Over 69% of the respondents indicated they taught in a school with fewer than 2,000 students.

Science: Reactions of Respondents to Word Attack and Vocabulary Skills (Table 6)

Four of the six Word Attack/Vocabulary skills were identified by over 75% of the respondents in science as needed for learning their subject matter. At least 50% of the respondents who indicated these skills were relevant expected they would need to offer help when students were required to use the skills in class. These skills were: a) identifying at sight frequently used words, b) using clues from the sentence to determine the meaning of an unfamiliar word, c) using roots, prefixes and suffixes to determine the meaning of a word, and d) seeking appropriate meaning for technical words and phrases.

One skill--identifying at sight frequently used words--was identified by at least 75% of the respondents as relevant for learning their subject matter, but less than 50% of the respondents who indicated the skill was relevant expected to need to offer help with it.

The remaining skill (using clues from the sentence to determine the correct pronunciation of a word) cannot be included in the list of relevant Word Attack/Vocabulary skills for science because less than 50% of respondents believed it relevant.

Science: Reactions of Respondents to Comprehension Skills (Table 7)

Ten of the fourteen skills in this category were identified by at least 75% of the respondents in science as relevant for learning their subject matter. At least 50% of the respondents who indicated these skills were relevant expected they would need to offer help when students were required to use the skills in class.

Of the remaining four skills in this category, on the basis of at least 50% of respondents identifying the skills as relevant, two skills can be included in the list of relevant comprehension skills for science, but two skills cannot be included. The skills that can be included are: a) questioning the relevance of information to a topic, and b) making use of transitional words, phrases and clauses as bridges to join ideas. The two skills that cannot be included are: a) considering author's purpose, and b) recognizing persuasive techniques.

Science: Reactions of Respondents to Study Skills (Table 8)

Eight of the fifteen skills in this category were identified by at least 75% of the respondents in science as relevant for learning their subject matter. At least 50% of the respondents who indicated these skills were relevant expected they would need to offer help when students were required to use the skills in class.

Two skills--adjusting reading speed to the purpose for reading and using basic references as needed--were identified by at least 75% of the respondents as relevant for learning their subject matter, but less than 50% of the respondents who indicated these skills were relevant expected they would need to offer students help with them.

On the basis of at least 50% of respondents believing the skill to be relevant, three of the remaining five skills in this category can be included in the list of relevant study skills for science. These three skills are: a) formulating questions relevant to the purpose for reading, b) skimming material for overview, and c) utiliz-

ing sources to locate materials. The remaining two skills in this category (taking notes as cognitive maps and taking notes by marking directly on the text) were identified as relevant by less than 50% of the respondents and thus cannot be included in the list for science.

Science: Additional Skills Suggested by Respondents

The following skills were offered by respondents in sciences as additions to the skills listed on the questionnaire: recognizing proper documentation of ideas advanced by an author, following directions, planning time.

Mathematics: Characteristics of the Respondents (Table 9)

Of the teachers responding to the questionnaire, 65 reported they were mathematics teachers. The mean number of years of teaching experience for these respondents was 13.092 and the mean number of graduate credits completed in education was 30.431. Of these 65 respondents, 56 (86.15%) indicated they had completed no graduate credits in the teaching of reading. Affiliation with grades 7 and 8 was reported by 27 respondents, while 36 indicated they taught grades 9 through 12. Over 67% of the respondents indicated they taught in a school with fewer than 2,000 students.

Mathematics: Reactions of Respondents to Word Attack and Vocabulary Skills (Table 6)

Three of the six skills in this category were identified by over 75% of the respondents in mathematics as relevant for learning their subject matter. At least 50% of the respondents who indicated these

skills were relevant expected they would need to offer help when students were required to use the skills in class. These three skills were: a) using clues from the sentence to determine the meaning of an unfamiliar word, b) using roots, prefixes and suffixes to determine the meaning of a word, and c) seeking appropriate meaning for technical words and phrases.

One skill--identifying at sight frequently used words--was identified by at least 75% of the respondents as relevant for learning their subject matter, but less than 50% of the respondents who indicated the skill was relevant expected to need to offer help with it.

More than 50% of the respondents believe that only one of the remaining two skills was relevant for mathematics, so only one of these two skills can be included in the list of relevant Word Attack/ Vocabulary skills for mathematics. The skill that can be included is sounding out words. The skill that cannot be included is using clues from the sentence to determine the correct pronunciation of a word.

Mathematics: Reactions of Respondents to Comprehension Skills (Table 7)

Six of the fourteen skills in this category were identified by at least 75% of the respondents in mathematics as relevant for learning their subject matter. At least 50% of the respondents who indicated these skills were relevant expected they would need to offer help when students were required to use the skills in class. These six skills were: a) using stated and implied sequence cues, b) analyzing relationships to reach conclusions, c) interpreting specialized notations, d) interpreting graphic displays, e) attempting to generalize from

information read, and f) attempting to apply information gained from reading.

For the remaining eight skills, three were not believed relevant by at least 50% of the respondents and cannot be included in the list of relevant comprehension skills for mathematics. The other five skills may be included by this criteria, and these are: a) determining the main idea of a paragraph, b) determining the main idea of a selection, c) questioning the relevance of information to a topic, d) identifying details that support a position, and e) making use of transitional words, phrases and clauses as bridges to join ideas. The three skills that cannot be included are: a) considering author's purpose, b) distinguishing fact from opinion, and c) recognizing persuasive techniques.

Mathematics: Reactions of Respondents to Study Skills (Table 8)

Four of the fifteen skills in this category were identified by at least 75% of the respondents in mathematics as relevant for learning their subject matter. At least 50% of the respondents who indicated these skills were relevant expected they would need to offer help when students were required to use the skills in class. These four skills were: a) adjusting reading speed to the type and difficulty of the material, b) attending to the organization of the material, c) using special features of books, and d) employing appropriate test taking strategies.

For the remaining eleven skills in this category, five skills were not believed relevant by at least 50% of respondents and cannot

be included in the list of relevant study skills for mathematics. Six skills can be included by this criteria, and these are: a) setting a purpose for reading, b) formulating questions relevant to the purpose for reading, c) adjusting reading speed to the purpose for reading, d) skimming material for overview, e) scanning material for details, and f) taking notes in short phrases.

Mathematics: Additional Skills Suggested by Respondents

The following skills were offered by respondents in mathematics as additions to the skills listed on the questionnaire: recognizing the key words to be defined, following directions.

Home Economics: Characteristics of the Respondents (Table 9)

Thirty-seven respondents reported they were home economics teachers. The mean number of years of teaching experience for these respondents was 12.216 and the mean number of graduate credits completed in education was 28.946. Of the thirty-seven respondents in this area, 30 (81.08%) indicated they had completed no graduate credits in the teaching of reading. Affiliation with grades 7 and 8 was reported by 14 respondents, while 22 indicated they taught grades 9 through 11. Over 59% of the respondents indicated they taught in a school with fewer than 2,000 students.

Home Economics: Reactions of Respondents to Word Attack and Vocabulary Skills (Table 6)

Three of the six skills in this category were reported by over 75% of the respondents in home economics as relevant for learning their

subject matter. At least 50% of the respondents who indicated these skills were relevant expected they would need to offer help when students were required to use the skills in class. These three skills were: a) using clues from the sentence to determine the meaning of an unfamiliar word, b) using roots, prefixes and suffixes to determine the meaning of a word, and c) seeking appropriate meaning for technical words and phrases.

One skill--identifying at sight frequently used words--was identified by at least 75% of the respondents as relevant for learning their subject matter, but less than 50% of the respondents who indicated the skill was relevant expected to need to offer help with it.

On the basis of at least 50% of the respondents' indicating the skill to be relevant for learning their subject matter, the remaining two skills in this category (sounding out words and using clues from the sentence to determine the correct pronunciation of a word) can also be included in the list of relevant Word Attack/Vocabulary skills for home economics.

Home Economics: Reactions of Respondents to Comprehension Skills

(Table 7)

Eight of the fourteen skills in this category were identified by at least 75% of the respondents in home economics as relevant for learning their subject matter. At least 50% of the respondents who indicated these skills were relevant expected they would need to offer help when students were required to use the skills in class.

One of the remaining six skills in this category (considering

author's purpose), cannot be included in the list of relevant comprehension skills for home economics because less than 50% of respondents believed it was relevant. Five skills, however, can be included, and these are: a) interpreting specialized notations, b) distinguishing fact from opinion, c) recognizing persuasive techniques, d) identifying details that support a position, and e) making use of transtional words, phrases and clauses as bridges to join ideas.

Home Economics: Reactions of Respondents to Study Skills (Table 8)

Nine of the fifteen skills in this category were identified by at least 75% of the respondents in home economics as relevant for learning their subject matter. At least 50% of the respondents who indicated these skills were relevant expected they would need to offer help when students were required to use the skills in class.

Of the remaining six skills in this category, two skills cannot be included in the list of relevant study skills for home economics because less than 50% of respondents indicated that they were relevant. By this 50% minimum criteria, however, four skills can be included, and these are: a) formulating questions relevant to the purpose for reading, b) adjusting reading speed to the purpose for reading, c) taking notes in informal/formal outlines, and d) utilizing sources to locate materials. The two skills that cannot be included are: a) taking notes as cognitive maps, and b) taking notes by marking directly on the text.

Home Economics: Additional Skills Suggested by Respondents

The following skills were offered by respondents in home economics

as additions to the skills listed on the questionnaire: spelling, listening, following directions.

Business Education: Characteristics of the Respondents (Table 9)

Thirty-seven respondents reported they were business education teachers. The mean number of years of teaching experience for these respondents was 15.432 and the mean number of graduate credits completed in education was 32.216. Of the 37 respondents in this area, 29 (78.34%) indicated they had completed no graduate credits in the teaching of reading. One respondent reported an affiliation with grades 7 and 8, while 36 indicated they taught grades 9 through 12. Approximately 30% of the respondents indicated they taught in a school with fewer than 2,000 students.

Business Education: Reactions of Respondents to Word Attack and Vocabulary Skills (Table 6)

Three skills were identified by over 75% of the respondents in business education as relevant for learning their subject matter. At least 50% of the respondents who indicated these skills were relevant expected they would need to offer help when students were required to use the skills in class. These three skills were: a) using clues from the sentence to determine the meaning of an unfamiliar word, b) using roots, prefixes and suffixes to determine the meaning of a word, and c) seeking appropriate meaning for technical words and phrases.

Two skills--sounding out words and identifying at sight frequently used words--were identified by at least 75% of the respondents as rele-

vant for learning their subject matter, but less than 50% of the respondents who indicated these skills were relevant expected they would need to offer students help with them.

On the basis of at least 50%, although less than 75%, of the respondents' indicating its relevance, the remaining skill (using clues from the sentence to determine the correct pronunciation of a word) can be included in the list of relevant Word Attack/Vocabulary skills for business education.

Business Education: Reactions of Respondents to Comprehension Skills (Table 7)

Three of the fourteen skills in this category were identified by at least 75% of the respondents in business education as relevant for learning their subject matter. At least 50% of the respondents who indicated these skills were relevant expected they would need to offer help when students were required to use the skills in class. These three skills were: a) determining the main idea of a paragraph, b) determining the main idea of a selection, and c) attempting to apply information gained from reading.

Two of the remaining eleven skills in this category cannot be included in the list of relevant comprehension skills for business education because less than 50% of respondents believed the skills were relevant to learning their subject matter. The two skills that cannot be included are distinguishing fact from opinion and recognizing persuasive techniques. By the 50% minimum criteria, however, the remaining nine skills can be included on the list.

Business Education: Reactions of Respondents to Study Skills (Table 8)

Eight of the fifteen skills in this category were identified by at least 75% of the respondents in business education as relevant for learning their subject matter. At least 50% of the respondents who indicated these skills were relevant expected they would need to offer help when students were required to use the skills in class.

One skill--adjusting reading speed to the type and difficulty of the materials--was identified by at least 75% of the respondents as relevant for learning their subject matter, but less than 50% of the respondents who indicated the skill was relevant expected to need to offer help with it.

Of the remaining six skills, four can be included in the list of relevant study skills for business education. Two skills cannot be included in the list because they were not identified as relevant by at least 50% of the respondents. The four skills that can be included are: a) formulating questions relevant to the purpose for reading, b) taking notes in short phrases, c) taking notes in informal/formal outlines, and d) utilizing sources to locate materials. The two skills that cannot be included are taking notes as cognitive maps and taking notes by marking directly on text.

Business Education: Additional Skills Suggested by Respondents

The following skills were offered by respondents in business education as additions to the skills listed on the questionnaire: spelling, correct grammatical usage, sentence structure.

Industrial Arts: Characteristics of the Respondents (Table 9)

Twenty-seven respondents reported they were industrial arts teachers. The mean number of years of teaching experience for these respondents was 14.418 and the mean number of graduate credits completed in education was 41.07. Of the 27 respondents in this area, 25 (92.59%) indicated they had completed no credits in the teaching of reading. Eleven respondents reported an affiliation with grades 7 and 8, while 16 indicated they taught grades 9 through 12. Over 77% of the respondents reported they taught in a school with fewer than 2,000 students.

Industrial Arts: Reactions of Respondents to Word Attack and Vocabulary Skills (Table 6)

Two skills were identified by over 75% of the respondents in industrial arts as relevant for learning their subject matter. At least 50% of the respondents who indicated these skills were relevant expected they would need to offer help when students were required to use the skills in class. The two skills were: a) using clues from the sentence to determine the meaning of an unfamiliar word, and b) seeking an appropriate meaning for technical words and phrases.

Two skills--sounding out words and identifying at sight frequently used words--were identified by at least 75% of the respondents as relevant for learning their subject matter, but less than 50% of the respondents who indicated these skills were relevant expected they would need to offer students help with them.

On the basis of at least 50% of respondents' indicating the rele-

vance of the skills, the remaining two skills (using clues from the sentence to determine the correct pronunciation of a word and using roots, prefixes and suffixes to determine the meaning of a word) can be included in the list of relevant Word Attack/Vocabulary skills for industrial arts.

Industrial Arts: Reactions of Respondents to Comprehension Skills (Table 7)

Five of the fourteen skills in this category were identified by at least 75% of the respondents in industrial arts as relevant for learning their subject matter. At least 50% of the respondents who indicated these skills were relevant expected they would need to offer help when students were required to use the skills in class. These five skills were: a) determining the main idea of a paragraph, b) determining the main idea of a selection, c) interpreting specialized notations, d) interpreting graphic displays, and e) attempting to apply information gained from reading.

Four of the remaining nine skills in this category were believed relevant by less than 50% of the respondents and so cannot be included in the list of relevant comprehension skills for industrial arts. Five skills can be included by the 50% minimum criteria, and these are: a) using stated and implied sequence cues, b) analyzing relationships to reach conclusions, c) questioning the relevance of information to a topic, d) attempting to generalize from information read, and e) making use of transitional words, phrases and clauses as bridges to join ideas. The four skills that cannot be included are: a) consider-

ing author's purpose, b) distinguishing fact from opinion, c) recognizing persuasive techniques, and d) identifying details that support a position.

Industrial Arts: Reactions of Respondents to Study Skills (Table 8)

Four of the fifteen skills in this category were identified by at least 75% of the respondents in industrial arts as relevant for learning their subject matter. At least 50% of the respondents who indicated these skills were relevant expected they would need to offer help when students were required to use the skills in class. These four skills were: a) setting a purpose for reading, b) formulating questions relevant to the purpose for reading, c) scanning material for details, and d) using special features of books.

Two skills--using basic references as needed and employing appropriate test taking strategies--were identified by at least 75% of the respondents as relevant for learning their subject matter but less than 50% of the respondents who indicated the skills were relevant expected they would need to offer help with them.

Of the remaining nine skills in this category two cannot be included in the list of study skills for industrial arts because less than 50% of the respondents indicated they were relevant. These two skills are: a) taking notes as cognitive maps, and b) taking notes by marking directly on text. By the 50% minimum criteria, however, the remaining seven skills can be included on the list.

Industrial Arts: Additional Skills Suggested by Respondents

One skill--following directions--was offered by respondents in

industrial arts as an addition to the skills listed on the questionnaire.

Grade Level: Characteristics of Respondents (Table 10)

The distribution of teachers by content areas and grade levels is shown in Table 10. Although the distribution of respondents is not equal between the categories for each of the content areas, in all seven content areas more respondents represented grades 9-12 than grades 6-8.

Grade Level: Reactions of Respondents to Word Attack/Vocabulary Skills (Table 11)

In some content areas, some skills in the Word Attack/Vocabulary category show more than ten percentage points difference between the percent of respondents at grades 6-8 and those at grades 9-12 who reported a skill to be relevant for learning their subject matter. In most instances, however, the scores for both groups are either above or below the 75% level for assessing the relevancy of that skill for learning the subject matter, thus there is agreement within a content area that the skill is relevant or not relevant for learning. The exceptions to this occur in three content areas. In English/language arts, one skill (using clues from the sentence to determine the correct pronunciation of a word) was considered relevant for grades 6-8 but not for grades 9-12. In home economics three skills were considered relevant for learning in grades 9-12, but not in grades 6-8. These three skills were: a) sounding out words, b) using clues from the sentence to determine the correct pronunciation of a

Table 10

Respondents: By Grade Level and Content Area

	Grades 6-8		Grades 9-12		Total Number
	Number	Percent	Number	Percent	
English/Language arts	43	49	45	51	88
Social studies	22	37	37	63	59
Science	33	47	38	54	71
Mathematics	29	45	36	55	65
Home economics	15	41	22	59	37
Business education	1	3	36	97	37
Industrial arts	11	41	16	59	27
TOTALS	154		230		384

Table 11

Word Attack/Vocabulary Skills: By Grade Level and Content Area,

Reaction of Respondents to Individual Skills

		English		Social studies		Science		Mathematics		Home economics		Business education		Industrial arts	
		6-8	9-12	6-8	9-12	6-8	9-12	6-8	9-12	6-8	9-12	6-8	9-12	6-8	9-12
	P[a]	49	51	37	63	47	54	45	55	41	59	3	97	41	59
Skill 1[d]	R[b]	95	93	85	78	88	84	59	53	60	81	100	81	60	87
	E[c]	44	47	50	48	57	58	59	60	40	47	100	43	17	46
Skill 2	R	100	96	100	91	76	87	79	75	93	96	-	92	60	88
	E	71	79	76	87	79	66	74	70	69	65	-	73	50	71
Skill 3	R	88	74	52	56	55	43	46	31	27	76	-	69	50	67
	E	69	64	82	48	86	80	69	58	60	63	-	59	60	70
Skill 4	R	100	93	95	86	91	94	86	94	93	96	100	94	90	93
	E	25	28	35	29	50	39	32	30	31	33	-	35	22	46
Skill 5	R	93	98	95	89	97	92	79	83	73	85	-	86	50	53
	E	79	86	74	81	88	77	78	77	36	72	-	61	100	63
Skill 6	R	86	82	86	97	97	97	86	94	100	96	-	94	90	100
	E	95	87	89	88	97	94	92	94	100	95	-	91	100	88

[a] P = Percent of teachers at that grade level in that content area.

[b] R = Percent reporting skill is relevant to subject matter.

[c] E = Percent reporting the expectation of need to offer help.

[d] Reading/learning skills for postelementary levels are listed in Appendix B.

word, and c) using roots, prefixes and suffixes to determine the meaning of a word. In industrial arts, two skills--sounding out words and using clues from the sentence to determine the meaning of an unfamiliar word--were considered to be relevant for learning in grades 9-12 but not in grades 6-8.

Grade Level: Reactions of Respondents to Comprehension Skills (Table 12)

In some content areas, some skills in the Comprehension category also show more than ten percentage points difference between the percent of respondents at grades 6-8 and those at grades 9-12 who reported a skill to be relevant for learning their subject matter. Again, as with the skills in the Word Attack/Vocabulary category, in most cases where such a difference exists there is still agreement within a content area that the skill is relevant or not relevant for learning. Within the Comprehension category the exceptions to this occur in five content areas. There are no exceptions in English/language arts and the responses in business education are not considered because there was only one respondent in the category for grades 6-8. In the content areas where the ten point difference means one grade level category considers the skill relevant and the other considers the skill not relevant, in all cases the skill was relevant for grades 9-12 and not relevant for grades 6-8. This response was evident in the content areas indicated:

- determining the main idea of a selection: home economics
- interpreting specialized notations: industrial arts
- considering author's purpose: social studies

Table 12

Comprehension Skills: By Grade Level and Content Area,

Reaction of Respondents to Individual Skills

		English		Social studies		Science		Mathematics		Home economics		Business education		Industrial arts	
		6-8	9-12	6-8	9-12	6-8	9-12	6-8	9-12	6-8	9-12	6-8	9-12	6-8	9-12
	P[a]	49	51	37	63	47	53	45	55	41	59	3	97	41	59
Skill 1[d]	R[b]	100	98	91	97	88	95	55	71	80	96	-	86	92	87
	E[c]	77	77	60	69	59	57	59	71	42	57	-	52	75	54
Skill 2	R	100	98	96	100	82	95	[illegible]	63	73	95	-	86	82	73
	E	84	75	76	73	62	59	50	71	46	55	-	60	67	46
Skill 3	R	95	96	81	94	79	80	83	86	87	82	-	67	70	69
	E	76	79	65	71	82	61	67	74	54	56	88	58	100	55
Skill 4	R	98	98	96	100	97	97	83	92	80	82	-	72	73	73
	E	95	91	95	95	97	89	96	94	75	90	-	85	100	64
Skill 5	R	35	20	29	56	88	95	93	97	60	59	100	67	73	88
	E	90	91	100	95	100	94	93	94	89	86	100	92	100	71
Skill 6	R	54	38	100	95	100	97	93	94	87	90	100	58	91	100
	E	93	65	91	86	88	92	82	88	92	89	100	83	80	75
Skill 7	R	88	96	50	87	19	41	14	32	7	60	-	56	46	29
	E	98	86	100	84	86	69	75	77	100	67	-	86	50	25
Skill 8	R	95	96	95	100	70	82	17	26	33	77	-	50	27	33
	E	88	91	83	97	92	77	60	73	80	94	-	72	100	40
Skill 9	R	91	87	71	94	16	49	21	17	47	62	-	42	18	7
	E	98	93	88	97	86	79	67	71	86	92	-	87	100	100
Skill 10	R	86	91	91	89	70	76	69	62	60	86	-	69	64	53
	E	92	90	90	91	77	86	86	71	78	84	-	62	100	63
Skill 11	R	93	96	91	100	78	95	45	67	47	81	-	75	60	40
	E	87	81	67	89	82	83	92	78	57	81	-	82	80	67
Skill 12	R	93	98	91	100	88	97	69	86	71	96	-	72	73	56
	E	93	89	81	89	70	74	85	84	55	57	-	62	86	56
Skill 13	R	98	93	100	100	97	97	90	94	93	100	-	89	100	100
	E	93	88	81	89	73	75	85	100	93	77	-	84	90	63
Skill 14	R	95	93	71	92	56	76	66	64	33	62	-	75	50	53
	E	95	90	63	77	58	42	68	91	50	92	-	70	83	50

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[a] P = Percent of teachers at that grade level in that content area.
[b] R = Percent reporting skill is relevant to subject matter.
[c] E = Percent reporting the expectation of need to offer help.
[d] Reading/learning skills for postelementary levels are listed in Appendix B.

- distinguishing fact from opinion: science, home economics
- recognizing persuasive techniques: social studies
- questioning the relevance of information to a topic: home economics
- identifying details that support a position: home economics
- generalizing from information read: mathematics, home economics
- making use of transitional words, phrases and clauses as bridges to join ideas: social studies, science

Grade Level: Reactions of Respondents to Study Skills (Table 13)

In some content areas, some skills in the Study category show more than ten percentage points difference between the percent of respondents at grades 6-8 and those at grades 9-12 who reported a skill to be relevant for learning their subject matter. Again, as with some skills in the other categories, where such a difference exists there is usually agreement within a content area that the skill is relevant or not relevant for learning. Exceptions occurred in four content areas: science, mathematics, home economics, and industrial arts. One skill (utilizing sources to locate materials) in one content area (science) was considered relevant for grades 6-8 but not for grades 9-12. For all other exceptions, the skill was found relevant for learning in grades 9-12 but not in grades 6-8. These exceptions and the corresponding content areas are as follows:

- setting a purpose for reading: home economics
- formulating questions relevant to the purpose for reading: mathematics, home economics
- adjusting reading speed to the type and difficulty of materials: mathematics, home economics, industrial arts

Table 13

Study Skills: By Grade Level and Content Area, Reaction of Respondents to Individual Skills

		English		Social studies		Science		Mathematics		Home economics		Business education		Industrial arts	
		6-8	9-12	6-8	9-12	6-8	9-12	6-8	9-12	6-8	9-12	6-8	9-12	6-8	9-12
	P[a]	49	51	37	63	47	53	45	55	41	59	3	97	41	59
Skill 1[d]	R[b]	98	95	90	92	79	76	59	71	71	96	-	94	82	80
	E[c]	93	83	78	77	50	67	53	69	50	70	-	56	67	58
Skill 2	R	76	86	79	86	70	76	59	77	33	76	-	63	91	86
	E	94	87	87	88	78	79	65	77	40	88	-	57	67	55
Skill 3	R	95	82	85	89	81	89	66	83	67	81	100	89	56	81
	E	65	72	71	74	39	63	47	60	30	65	-	50	33	39
Skill 4	R	93	82	84	94	69	85	59	74	53	71	100	86	16	73
	E	68	64	56	65	25	48	41	52	38	53	-	55	40	18
Skill 5	R	93	100	95	89	73	81	79	78	73	86	-	86	73	75
	E	90	93	86	80	76	77	78	89	82	95	-	65	88	50
Skill 6	R	74	69	85	87	72	75	59	64	93	86	100	75	64	73
	E	69	74	72	77	58	46	50	64	43	55	100	68	67	36
Skill 7	R	84	77	90	87	84	81	66	75	93	86	100	83	82	94
	E	76	74	65	71	56	46	70	73	57	60	100	71	75	47
Skill 8a	R	86	95	90	94	80	84	48	60	93	81	-	69	50	67
	E	83	82	90	78	74	71	64	64	71	69	-	71	75	50
Skill 8b	R	78	90	78	86	72	86	25	53	54	75	-	56	56	57
	E	88	97	93	86	85	75	100	73	100	86	-	67	100	50
Skill 8c	R	43	24	77	75	32	63	19	46	8	23	-	23	13	43
	E	93	89	86	91	100	77	100	79	100	100	-	71	100	33
Skill 8d	R	30	49	19	30	7	30	14	57	8	36	-	31	13	29
	E	100	88	100	58	50	50	75	60	100	83	-	42	-	50
Skill 9	R	98	91	100	89	94	95	90	83	93	86	100	85	60	94
	E	67	63	68	76	61	69	65	80	57	53	100	76	86	67
Skill 10	R	100	100	100	97	85	78	45	50	100	86	100	86	82	88
	E	61	63	59	56	31	48	57	67	33	63	-	68	13	36
Skill 11	R	98	93	96	97	78	62	21	35	27	91	-	60	56	50
	E	69	83	81	78	62	55	67	58	25	70	-	77	83	50
Skill 12	R	93	96	100	100	85	95	93	97	100	100	-	89	60	88
	E	80	95	90	84	79	77	89	77	60	77	-	87	43	50

[a] P = Percent of teachers at that grade level in that content area.
[b] R = Percent reporting skill is relevant to subject matter.
[c] E = Percent reporting the expectation of need to offer help.
[d] Reading/learning skills for postelementary levels are listed in Appendix B.

- adjusting reading speed to the purpose for reading: science
- attending to the organization of material: home economics
- taking notes in informal/formal outlines: science, home economics
- using special features of books as appropriate: industrial arts
- utilizing sources to locate materials: home economics
- employing appropriate test taking strategies: industrial arts

Summary and Conclusions

The results show that the list of reading/learning skills submitted to the participants in this study is an appropriate list of skills for the postelementary grades. The skills included on the list are usually taught with narrative materials at elementary levels. At post-elementary levels teachers' responses to the questionnaires confirm that the skills remain relevant for learning expository materials in seven content areas: English/language arts, social studies, science, mathematics, home economics, business education, and industrial arts.

The more than four hundred teachers who responded to this study appear to form a representative cross section of teachers. Teachers at all grade levels, seven through twelve, responded in similar numbers. All requested content areas were addressed by the respondents, as well as other, unrequested content areas. Although smaller schools may have been underrepresented, schools of all sizes appear in the data.

Very few respondents had been teaching for less than five years; only two had been in the classroom for only one year. Most teachers had completed some graduate work in education, but few had completed any credits in the teaching of reading. The responses from this broad section of the teaching population can, therefore, be interpreted as a credible representation of postelementary teachers as a whole.

Additional skills (as well as other behavior patterns that can not be technically defined as skills) were suggested for inclusion by some of the respondents. Only one of these suggestions--following directions--was volunteered often enough to suggest a consensus concerning its importance. All thirty-five skills were not considered relevant by a 75% majority of the respondents in all seven content areas. In the results, however, three trends are apparent across the content areas: a) a relevancy/expectation relationship, b) a grade level response pattern, and c) a content area/professional literature response pattern.

When the respondents reported a skill was relevant for learning their subject matter, they also expected to need to offer help with it in their classes. This pattern was not expected. I anticipated that teachers would identify at least some skills as relevant for their content areas, but not that they would expect to need to offer students help with so many of these skills. In only two instances did the teachers across all seven content areas identify a skill as relevant, but report they did not expect to need to offer help with it. Both of these skills were in the Word Attack/Vocabulary category and are usually taught in a remedial reading class. They are

a) sounding out words, and b) identifying at sight frequently used words. The other skills in the Word Attack/Vocabulary category that are usually associated with developmental reading were identified by the respondents as important for learning.

Second, a grade level response pattern is apparent. For some skills there are ten or more percentage points difference in the responses between teachers of grades 6-8 and teachers of grades 9-12 (see Tables 11, 12, 13). In most instances, when a specific skill is considered relevant by one category of teachers but not by the other, it is considered relevant by those in the upper grade level category. There are only two exceptions to this: one Word Attack/Vocabulary skill for English/language arts and one Study skill for science. Although the explanation for this could be the nature of the specific courses, this pattern is highly unexpected. We have in the past made the assumption that junior high teachers, many of whom are trained in departments of elementary education (K-8) are more sensitive to the basic skill needs of students than are senior high teachers, who are essentially subject matter experts. The results of this study cause questions to be raised about this assumption.

Third, a pattern appears to emerge concerning specific content areas and the professional literature that outlines the importance of the reading process for learning various subjects. Witte, Morrison and Otto (1979) surveyed professional content area publications and discovered that while journals in English/language arts and social studies periodically offer articles on the importance of the reading process for learning in those content areas, fewer such articles are available to

professionals in science and mathematics. Such articles are almost non-existent for professionals in home economics, business education, and industrial arts. The awareness of the reading process developed by this professional literature could be reflected in the response of various content areas to the Comprehension and Study skills in the study. Although this hypothesis needs to be studied, in the meantime we must find better means to make content area teachers more aware of the application of reading skills for learning.

There are three considerations that this study does not address:

1) Do the teachers who consider a skill to be relevant and expect to need to offer help with it feel prepared to handle the skill? Do these teachers want additional suggestions for implementing skill application with their content area instruction?

2) Do teachers who expect to need to offer help with a skill actually offer that help? In what way(s) is that help offered?

3) Are there skills that teachers do expect the students to apply that were not so identified in this study? If so, what are they?

The first consideration could be addressed by a second questionnaire and further validated by personal interviews. The other two considerations require documented classroom observation for each of the content areas.

At present, then, the list of 35 reading/learning skills can be considered a valid list of skills for postelementary instruction. The skills can be used in three ways: a) to guide the remedial development of individual students at these grade levels, b) to develop awareness of the importance of the reading process for learning subject matter among prospective content area teachers at the preservice

levels, and c) to plan for content area teachers meaningful inservice sessions that would offer practical suggestions for helping students to apply their reading skills.

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APPENDIX A
Content Area Teaching Methods Textbooks Reviewed

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APPENDIX B
Reading/Learning Skills for Postelementary Levels

Word Attack and Vocabulary Skills

1. The student sounds out words.
2. The student uses clues from the sentence to determine the meaning of an unfamiliar word.
3. The student uses clues from the sentence to determine the correct pronunciation of a word.
4. The student identifies at sight frequently used words.
5. The student uses roots, prefixes, suffixes to determine the meaning of a word.
6. The student seeks appropriate meaning for technical words and phrases.

Comprehension Skills

1. The student determines the main idea of a paragraph.
2. The student determines the main idea of a selection (i.e., several paragraphs).
3. The student uses stated (e.g., first, next) and implied sequence clues.
4. The student analyzes relationships (e.g., cause and effect) to reach conclusions.
5. The student interprets specialized notations (e.g., formulas, equations).

6. The student interprets graphic displays (e.g., maps, graphs, tables, diagrams, patterns).
7. The student considers author's purpose.
8. The student distinguishes fact from opinion.
9. The student recognizes persuasive techniques.
10. The student questions the relevance of information to a topic.
11. The student identifies details that support a position.
12. The student attempts to generalize from information read.
13. The student attempts to apply information gained from reading.
14. The student makes use of transitional words, phrases, and clauses as bridges to join ideas.

Study Skills

1. The student sets a purpose for reading.
2. The student formulates questions relevant to his or her purpose for reading.
3. The student adjusts reading speed to the type and difficulty of the materials.
4. The student adjusts reading speed to his or her purpose for reading.
5. The student attends to the organization of material.
6. The student skims material for overview.
7. The student scans material for details.

8. The student takes notes in meaningful way:
   a. short phrases.
   b. informal/formal outlines.
   c. cognitive maps.
   d. marking directly on text.
9. The student uses special features of books (e.g., table of contents, index) as appropriate.
10. The student uses basic references (e.g., dictionary) as needed.
11. The student utilizes sources (e.g., card catalog) to locate materials.
12. The student employs appropriate test taking strategies.

APPENDIX C
Questionnaire and Directions

February, 1979

Directions:

Please choose one specific class you are currently teaching to keep in mind as you respond to these skills. You may choose any class (we would prefer it would be the one you teach to the most students), but please tell us which one:

For each skill listed you will need to respond to TWO parts:

Part A, The relevance of the skill for your subject area.
Select one statement from the three that follow that most accurately describes the situation as you view it (the abbreviated statement that is on the response page is in parentheses below):

- All students must have and be able to apply this skill to deal with the subject matter in this class. (Needed)
- This skill is not essential for dealing with the subject matter in this class. (Not Needed)
- Depends - please explain.

Part B, Your expectations of the student's abilities to use this skill.
For each skill you indicated was "needed", select one statement from the two that follow that most accurately describes your position (the abbreviated statement that is on the response page is in parentheses below):

- I expect that students will need my help in using this skill in my class. (Help Needed)
- I expect students to have this skill well developed and functioning before arriving in my class so I do not pay any attention to it. (No Help Needed)

Survey: Learning/Reading Skills for _____
(Please indicate your content area)

A. Please complete the following:

1. Total number of years of teaching experience _____

2. Number of years of experience in teaching in this content area _____

3. Total number of graduate credits completed in education _____

4. Number of graduate credits completed in the teaching of reading _____

5. Approximate number of students in attendance at your school _____

B. Please list the classes, by title, that you are currently teaching:

	Class Title	No. of Students	Grade Level of Students
1.			
2.			
3.			
4.			
5.			
6.			
7.			

C. (Optional) We are sending this survey to teachers in eight states. Up to this point we have no way to identify who you are, what school you are affiliated with, etc. We do not think at this point we will need that information. But, we find ourselves in a predicament. If we should have a question about your response, we would like to be able to contact you. If you will give us your name and address to use if need be, we promise to share it with no one.

Name _____

Address _____

_____

WORD ATTACK AND VOCABULARY SKILLS	A. Relevancy of the Skill? Needed	Not Needed	Depends... Please Explain	B. Your expectations of the students' ability? Help Needed	No Help Needed
1. The student sounds out words.					
2. The student uses clues from the sentence to determine the meaning of an unfamiliar word.					
3. The student uses clues from the sentence to determine the correct pronunciation of a word.					
4. The student identifies at sight frequently used words.					
5. The student uses roots, prefixes, suffixes to determine the meaning of a word.					
6. The student seeks appropriate meaning for technical words and phrases.					

Are there skills you feel we should have included? If so, what are they?

Other comments (use other side if necessary)...

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COMPREHENSION SKILLS	A. Relevancy of the Skill? Needed	Not Needed	Depends... Please Explain	B. Your expectations of the students' ability? Help Needed	No Help Needed
1. The student determines the main idea of a paragraph.					
2. The student determines the main idea of a selection (i.e., several paragraphs).					
3. The student uses stated (e.g., first, next) and implied sequence clues.					
4. The student analyses relationships (e.g., cause and effect) to reach conclusions.					
5. The student interprets specialized notations (e.g., formulas, equations).					
6. The student interprets graphic displays (e.g., maps, graphs, tables, diagrams, patterns).					
7. The student considers author's purpose.					
8. The student distinguishes fact from opinion.					
9. The student recognizes persuasive techniques.					
10. The student questions the relevance of information to a topic.					
11. The student identifies details that support a position.					
12. The student attempts to generalize from information read.					
13. The student attempts to apply information gained from reading.					
14. The student makes use of transitional words, phrases and clauses as bridges to join ideas.					

Are there other Comprehension Skills you feel we should have included? If so, what are they?

Other comments...

STUDY SKILLS	A. Relevancy of the Skill? Needed	Not Needed	Depends... Please Explain	B. Your expectations of the students' ability? Help Needed	No Help Needed
1. The student sets a purpose for reading.					
2. The student formulates questions relevant to his/her purpose for reading.					
3. The student adjusts reading speed to the type and difficulty of the materials.					
4. The student adjusts reading speed to his/her purpose for reading.					
5. The student attends to the organization of material.					
6. The student skims material for overview.					
7. The student scans material for details.					
8. The student takes notes in meaningful way: a. short phrases. b. informal/formal outlines. c. cognitive maps. d. marking directly on text.					
9. The student uses special features of books (e.g., table of contents, index) as appropriate.					
10. The student uses basic references (e.g., dictionary) as needed.					
11. The student utilizes sources (e.g., card catalog) to locate materials.					
12. The student employs appropriate test taking strategies.					

Are there Study Skills you feel we should have included? If so, what are they?

Other comments...